Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Rural Digital Opportunity Fund	)	WC Docket No. 19-126
	)	
Connect America Fund	)	WC Docket No. 10-90
	)	

REPLY COMMENTS OF
HUGHES NETWORK SYSTEMS, LLC

Hughes Network Systems, LLC ("Hughes") provides this reply to the comments submitted in the above-captioned proceeding regarding the development of the Rural Digital Opportunity Fund ("RDOF").[1]

As discussed in more detail below, the record developed thus far in this proceeding supports the award of RDOF support via a competitive process in which satellite broadband providers play an appropriate role that enables them to leverage the advantages of their network infrastructure to provide cost-effective service in the hardest-to-serve rural areas. To do so, the Commission should not increase the bid weighting for latency beyond the twenty-point value assigned in the Connect America Fund Phase II ("CAF-II") auction. Finally, the record also shows significant interest in using modern hybrid networks to provide RDOF service, using multiple paths to reach customer locations with latency-sensitive and speed-sensitive traffic. The bid weighting and performance requirements should be modified to allow providers to leverage hybrid networks, and the Commission should release a public notice without delay seeking

[1] *Rural Digital Opportunity Fund, Connect America Fund,* Notice of Proposed Rulemaking, FCC 19-77 (rel. Aug. 2, 2019) ("NPRM"). References in this reply to parties' comments refer, unless otherwise indicated, to submissions in this docket on or about Sept. 20, 2019.

comment on relevant issues related to hybrid networks in order to incorporate them into the RDOF rules.

I. THE RECORD SUPPORTS A COMPETITIVE PROCESS IN WHICH SATELLITE PROVIDERS PLAY AN APPROPRIATE ROLE

Consistent with Hughes's comments,[2] the record supports the award of RDOF funding through a competitive process in which different technologies and service levels compete with one another to provide the most cost-effective, high-quality service to customers.[3]

Despite these compelling arguments, some commenters propose that satellite providers be excluded from the RDOF, but they fail to justify their arguments. The facts do not support, as discussed below, excluding satellite broadband providers because of geostationary satellite service's higher latency.[4] Satellite broadband service is integral to meeting the needs of rural users throughout the United States and is able to meet higher speed demands and support the deployment of next-generation wireless services in rural areas such as 5G.[5] Satellite broadband speeds are increasing with each new generation of broadband satellites.[6] Hughes brought 25/3 service to many areas of the country with the launch of its Jupiter 1 satellite in 2012, and expanded that to the entire continental U.S., southern Alaska, and the Caribbean U.S. Territories with the launch of Jupiter 2 in 2017. Hughes is preparing for the launch, in 2021, of Jupiter 3,

[2] Hughes Comments at 3.

[3] *See, e.g.*, INCOMPAS Comments at 7-8; SES Comments at 2; USTelecom Comments at 32-34; UTC Comments at 7; USCellular Comments at 5-8.

[4] *See infra* Section II.

[5] *See, e.g.*, INCOMPAS Comments at 7; USTelecom Comments at 22-23; Verizon Comments at 4-6; Viasat Comments at 2-3.

[6] Cite to our evolution paper.

which will provide 100/20 service and higher capacity throughout the continental United States Future generations of broadband satellites will provide even higher speeds and greater capacity.

Second, satellite will be an integral part of5G. Satellite technology is widely regarded as foundational for the development of 5G. As this Administration has observed:

> Satellite technology will also support many terrestrial communications advancements in the coming years, including support for, and integration with, 5G communications platforms. For example, satellites can help bring 5G and other next-generation services to rural and other areas where it is not economically feasible for terrestrial companies to lay fiber-optic cables, benefiting ranchers, farmers, pilots, sailors, and others.[7]

Other commentators have similarly noted that "[s]atellite communications will be an essential part of the 5G infrastructure,"[8] and that "5G is a 'network of networks' and satellites are part of that new network,"[9] with satellite providers expected to play a key role in "supporting delivery of service in 'unserved or underserved areas.'"[10]

Of course, as these observations reflect, Hughes does not expect satellite broadband providers to support 5G networks singlehandedly, just as satellite broadband is one part of the

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[7] White House Office of Science and Technology Policy and U.S. Department of Commerce, "Driving Space Commerce Through Effective Spectrum Policy," at 6 (March 2019), https://www.ntia.doc.gov/files/ntia/publications/drivingspacecommerce.pdf. In addition, the European Union has highlighted that satellites are part of the 5G solution for years. *See* European Commission, Research & Standards, https://ec.europa.eu/digital-single-market/en/research-standards; European Commission, 5G Vision: The 5G Infrastructure Public Private Partnership: the next generation of communication networks and services, at 9 (Feb. 2015), https://5g-ppp.eu/wpcontent/uploads/2015/02/5G-Vision-Brochure-v1.pdf.

[8] Semir Hassanaly, "The Role of Satellite in 5G," *Newtec* (March 27, 2018), https://www.newtec.eu/article/article/the-role-of-satellite-in-5g.

[9] Sean Kinney, "The Role of Satellites in Delivering 5G," *RCR Wireless News* (Jan. 8, 2018), https://www.rcrwireless.com/20180108/5g/the-role-of-satellites-in-delivering-5g-tag17-tag99.

[10] *Id.* *See also* Viasat comments at 20-21 (statutory purpose of universal service support is to fund consumer services, not backbone networks).

solution to rural connectivity more generally. As Hughes observed in its comments, "[s]atellite broadband presents a particularly cost-effective option for providing high-speed broadband services at a reasonable cost, especially in areas where the costs of terrestrial facilities are prohibitively high."[11] The RDOF will not be successful unless satellite broadband providers can continue to serve this crucial role.

For all these reasons, the Commission should award RDOF support through a technology-neutral, competitive process.

II. THE RECORD SUPPORTS REDUCING THE PROPOSED FORTY-POINT LATENCY PENALTY

As several commenters point out, the proposal to increase the latency penalty from 25 points in the Connect America Fund Phase II ("CAF-II") auction to 40 points in the RDOF auction must be rejected.[12] USCellular correctly observes that "the Commission provides no analysis as to why the weight for high latency should be increased from 25 to 40, other than to state in conclusory fashion that it wants to retain the 90-point spread between top and bottom bidding tiers that was used in the CAF-II auction."[13] Yet, as USCellular points out, that 90-point spread effectively shut out bidders in the lowest bidding tier from being "able to 'place competitive bids.'"[14]

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[11] Hughes Comments at 2. *See also* USTelecom Comments at 23 ("This is not to say satellite has no role in providing broadband service in rural areas—it is probably the best technology available for serving the most remote areas of the country where the economics of terrestrial broadband are not justified with any reasonable subsidy.").

[12] *See, e.g.,* North Dakota Joint Commenters Comments at 4; USCellular Comments at 5-8; Viasat Comments at 6-23;

[13] USCellular Comments at 8.

[14] *Id.* at 6.

This point is borne out by an analysis submitted by Viasat by noted economists Paul Milgrom and Ilya Segal concluding that increasing the latency weight to 35 (less than the 40-point allocation proposed in this proceeding) would have eliminated the positive impact that Viasat's participation had on the auction's outcome, "resulting in a large number of locations losing coverage, with only a tiny number of locations gaining terrestrial coverage."[15] The Milgrom study is, not surprisingly, much more compelling than the paper by the Cartesian consulting group (with no authors' names attached) submitted by the Fiber Broadband Association, which uses arbitrary and unsubstantiated estimates of the "benefits" of various types of broadband to present conclusions blatantly biased in favor of fiber-based networks.[16]

Further, the data in the record refutes the self-serving requests of some commenters for a forty-point or higher latency penalty based on user experience.[17] Hughes's comments present evidence based on objective data demonstrating that "latency does not have a significant negative impact on consumers' day-to-day usage of broadband services."[18] Viasat presents a similar factual analysis.[19] There is no objective data in the record questioning this factual

[15] Viasat Comments, Attach. A at 3.

[16] *See* Fiber Broadband Association Comments at App. A.

[17] *See, e.g.*, Fiber Broadband Association Comments at 8-11; ITTA Comments at 19.

[18] Hughes Comments at 4, analyzing data From Cisco Visual Networking Index and FCC Internet access service reports.

[19] Viasat Comments at 14-16. *See also* Big River Comments at 2 ("much of the data that comes across broadband networks today show little impact on the consumer's experience even when latency is several hundred milliseconds").

conclusion. Viasat is correct that the proposal to increase the latency penalty "is unsustainable as a policy matter" and "lack[s] any conceivable evidentiary support or rational basis."[20]

Other commenters fallaciously point to the robust debate that occurred regarding the Commission-imposed voice testing metrics for high-latency bidders in CAF auctions as a reason to increase the latency penalty.[21] That debate, however, pertained solely to a problematic testing methodology which the Bureaus have since revised; it never questioned the fact that "'real-world experience also shows that satellite voice customers are satisfied with their voice service.'"[22] There is no indication that satellite providers will not be able to demonstrate the required voice quality score now that the Bureaus have addressed problems in the testing methodology.[23] Thus, the now-resolved debate over the methodology for Mean Opinion Score testing is no reason to modify the latency score. Finally, the FCC must reject the proposals of commenters to increase the latency penalty simply as a means of excluding satellite broadband providers.[24] Such an

[20] Viasat Comments at 4.

[21] *See, e.g.,* ITTA Comments at 19-21; USTelecom Comments at 22-23.

[22] *Connect America Fund,* Order on Reconsideration, DA 19-911, at ¶ 15 (WCB WTB OET rel. Sept. 12, 2019) ("*MOS Reconsideration Order*"), *quoting* Reply Comments of Hughes Network Systems, LLC, WC Docket No. 10-90 at 10-11 (filed Nov. 19, 2018).

[23] *See MOS Reconsideration Order* at ¶ 15 & n.48 ("we believe that satellite providers with a well-engineered and well-maintained network will be able to show a MOS of 4 under the methodologies adopted herein"); Letter from Jennifer A. Manner, Hughes to Marlene H. Dortch, FCC, WC Docket No. 10-90 at 1 (filed Sept. 25, 2019) (Hughes "has previously expressed concerns that the original MOS testing framework adopted by the Bureaus might not be achievable by satellite broadband providers using geostationary satellites. Hughes has reviewed the modified requirements delineated in the *MOS Reconsideration Order*. Based on its review, Hughes believes it can meet these requirements.") (internal citation omitted).

[24] *See, e.g.,* USTelecom Comments at 24.

exclusion is not supportable, as discussed in the previous section,[25] and in fact, would harm the public interest by eliminating a cost-effective, broadband service provider from the RDOF program without a factual basis

For all these reasons, the latency weighting in the RDOF auctions should be set at or below the 25-point value used in the CAF-II auction.

III. THE COMMENTS SHOW THE IMPORTANCE OF PROPERLY WEIGHTING HYBRID NETWORKS IN RDOF AUCTIONS

The record demonstrates that, "[i]n today's telecommunications environment, broadband networks are increasingly becoming hybrid in nature—using two or more disparate access technologies to a customer's location."[26] As hybrid networks become more commonplace, it is imperative that the Commission revise its proposed RDOF rules to enable their use in the RDOF auctions. This requires modification to the bid-weighting matrix to reflect these networks' total characteristics.

Both Big River and Viasat explain how, with the use of hybrid networks, latency-sensitive traffic can be identified and sent along a low-latency network path, while less-latency-sensitive traffic requiring higher throughput can be transmitted over a higher-speed network.[27] Similarly, SES points out that it is able to leverage its combination of high-throughput (but higher latency) GSO satellites with lower-latency NGSO satellites to deliver a combination of

[25] *See supra* Section I.

[26] Big River comments at 1-2.

[27] *Id.* at 2; Viasat Comments at 24-26.

fiber-like speeds and low latency which "could be used to bring new levels of connectivity to rural America."[28]

There is broad support for modifying the bidding matrix and performance criteria in order to permit providers to bid effectively proposing hybrid networks.[29] To achieve this, Viasat proposes that the Commission modify the requirement that a network meet the 100 ms standard 95 percent of the time in order to bid in the low-latency tier, and allow a hybrid network operator to bid in the low-latency tier if it "meets the MOS of four requirement for VoIP service and routes other latency-sensitive traffic over low-latency links that provide 100 ms of latency 95 percent of the time."[30] Hughes agrees that the Commission should adopt rule changes consistent with this proposal to allow bidders to leverage modern hybrid networks to meet customers' voice and data service needs.

The issue of hybrid networks was not adequately raised in the NPRM, however, and the Commission would benefit from additional input on the rules that would have to be issued to account for hybrid networks in RDOF auctions.[31] Given the strong interest in hybrid networks raised in the record, demonstrating the importance of addressing this issue, Hughes urges the Commission to quickly issue a public notice seeking comment on how to modify the proposed

[28] SES Comments at 3-4.

[29] *See, e.g.*, Big River Comments at 4; Muscogee (Creek) Nation Comments at 10; SES Comments at 4; Utilities Technology Council Comments at 17; Viasat Comments at 23-26.

[30] Viasat Comments at 25.

[31] For example, the definition of "latency-sensitive traffic" would benefit from additional public comment. Hughes anticipates submitting additional information regarding this definition in the near future.

RDOF rules to permit bidding by entities proposing hybrid networks, including any needed definitions.

CONCLUSION

Hughes urges the Commission to recognize the important value that satellite broadband providers have in the broadband marketplace and in universal service auctions, reject unreasonable latency penalties and other efforts to eliminate satellite providers from competing in RDOF auctions, and modify the proposed bidding and performance requirements to allow effective bidding using hybrid networks. By doing so, the Commission can ensure that the RDOF best achieves the Commission's goals of closing the digital divide in rural areas.

Respectfully submitted,

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October 21, 2019